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RTD TODAY

Resources and Technology Division
Economic Research Service
U.S. Department of Agriculture, Washington, DC

A newsletter for employees
and colleagues of RTD

SECOND QUARTER
1993

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FROM THE DIRECTOR'S OFFICE

As is well known at this point, ERS, and as a consequence RTD, will be operating with a serious budget constraint for the foreseeable future. Discretionary funding will be extremely limited and salary and benefits will be allocated to Divisions based on March 20 staff-on-board numbers minus an assumed 4 percent staff attrition rate. Over the next 4 years, ERS is slated to downsize by 25 percent. RTD's senior management staff held a retreat on May 19 in Washington to address issues posed by the budget. Laurian Unnevehr, University of Illinois, who joined us as Chief of the Environmental and Health Risk Branch on July 12, and John Reilly, who will be returning from his Intergovernmental Personnel Act appointment at MIT, participated in the meeting.

Areas for review included mission (scope, priorities); organizational structure (Branches, Sections); operating procedures (staffing, reimbursements); output (research, situation and outlook, staff analysis); and data (surveys, data development, products). We discussed options available to RTD for short term budget relief under the ERS operating rules; these include outplacement of staff and reimbursements. (Funds generated by either of these activities will remain with the Division).

I am very pleased that we quickly agreed on a number of steps that should sharpen our focus and serve our clientele more effectively. The consensus was that the scope of the program in terms of issues would continue as it has been in FY 93, but with a higher priority assigned to food safety. Organizationally, we decided to operate with 3 sections per branch (as opposed to 4) but to maintain the current 5 branch structure. Our target staff ceiling for next year is 125. We plan to maintain branches of roughly equal size. I have asked Carol Kramer to develop a system for operating an open season to allow staff to move among branches and sections within the established ceilings. This offers opportunities for broadening the work experience of our staff, and will be necessary to fill gaps left vacant because of the Departmental hiring freeze. In the short term we are reassigning support staff to provide adequate office coverage during the hiring freeze and downsizing.

In terms of operating procedures, we agreed to pursue both reimbursements and outplacement but in a manner consistent with maintaining the integrity of our core program. To the extent permitted under Departmental rules, incentives will be provided to encourage staff to pursue reimbursements for the Division. To protect the integrity of our program we will require staff to better track time allotted to various projects.

FOOTNOTE: RTD Branch and other units are abbreviated in this letter, as follows:

Office of the Director (OD), Environmental and Health Risk Branch (E&HR), Land and Global Resources Branch (L&GR), Resource Policy Branch (RP), Water Branch (W), and Productivity and Emerging Technologies Branch (P&ET)

We are proud of the skills and talents of our staff but, given the limited options for dealing with the budget, we must entertain possibilities for salary savings to the Division through outplacement. Optional arrangements to facilitate outplacement are being explored.

Perhaps the biggest decision at the retreat was how we manage output. We are considering options to revise our publication policy. We anticipate focusing on a limited number of research products that synthesize our knowledge on high priority policy issues. These products would be initiated and completed in a 1 year time frame with staff assigned to research teams. Options are also being considered for more efficient distribution of current information disseminated through our Situation and Outlook program. We would like to reduce the number of reports, perhaps to one, but serve our clientele with more frequent data releases through **RTD Updates** and other products and services. Other publication options are being considered, but it is clear that the budget will force us to be more selective and to better target our output. Decisions on our publication policy will be made soon, and will be a major focus for upcoming work plan reviews for FY 94.

Our retreat agenda included a discussion of our data program. Our survey funds have been substantially reduced but we are fortunate to be able to maintain a core program of data collection. We are committed to improving our delivery capability for the data we collect and our publication policy will exploit the use and timely release of our data. We also discussed staff analysis. Margot Anderson, our Deputy Director for Policy Research and Staff Analysis, discussed the recently issued procedural change for staff analysis. Margot is pursuing new opportunities for bringing our research information to the attention of policy officials. Our relevance in the policy arena will very much determine the support we can expect in the future.

The future we face is uncertain, but we have an extraordinarily talented and resourceful staff. I empathize with your concerns about the uncertainty, and I will promptly share any new information I have regarding our future budget situation. Many of the changes we are making reflect greater emphasis on leadership and policy relevance; changes we should make regardless of the budget. I welcome the challenges of sharpening the focus of our program, and am confident that, with your help, we will continue to fare well.



JOHN A. MIRANOWSKI

PROGRAM HIGHLIGHTS

Water Quality Program Update

RTD has a strong program in water quality related research, analysis, and data collection. These programs enable the Division to respond to staff analysis requests from the Department, and to supply information to other Federal agencies, the Congress, and the public.

Three publications in the new RTD Water Quality series have been released, including an analysis of water quality controls for cotton production, an evaluation of issues in the Clean Water Act Reauthorization, and a summary of procedures for estimating the economic value of water quality impacts of agriculture programs. In addition, topics covered by other publications released include the economics of pesticide restrictions, modeling the demand for agricultural chemicals, the economics of managing nutrient losses from crop production, issues in valuing non-market goods (such as water quality), assessment of the interaction between USDA programs and areas with impaired waters, and exploring the potential of point-nonpoint trading as a viable water quality protection tool.

In support of USDA's Water Quality Program, RTD conducted an evaluation of demonstration, technical assistance and cost-share efforts in 3 Hydrologic Unit Area projects and 2 Demonstration projects. The goal was to arrive at several generalizable conclusions about how such studies should be conducted in the future, and to identify some initial lessons for public agricultural policy.

A prerequisite for any viable research program is quality data. RTD has underway two major data initiatives that are supporting research. RTD, along with NASS, initiated a data collection effort to characterize current chemical use in agriculture. The Chemical Use Surveys are conducted annually for field crops, and bi-annually for vegetables and for fruits and nuts. These surveys will provide, over time, a quality data base for evaluating policies aimed at protecting water quality and ensuring food safety.

The Area Study Survey is a cooperative project of RTD, NASS, USGS, and SCS. This project is designed to provide the information necessary for understanding the conditions under which agricultural use does or does not impact water quality. USGS is assisting in establishing the land use-water quality linkages for evaluating the impacts of agricultural programs and policies on water quality across broad regions. Surveys at four of the project areas were conducted in 1991, four were conducted in 1992, and four more are to be completed this year for a total of 12. A number of research efforts are planned around the Area Study survey data, and the broad geographical and resource conditions represented in the projects will enable RTD to greatly improve its ability to examine how policies affect crops under different resource and economic conditions. Complementing ERS research, Purdue University, Montana State University, University of Connecticut, and VPI researchers are cooperating in Area Studies.

In the upcoming year, RTD will continue to build on past research, and expand into some important new areas. RTD researchers will use the Area Study data to evaluate the impacts on farm management, farm income, and water quality of various agricultural and environmental policies, including USDA's Water Quality Program, the Farm Bill and the Clean Water Act. The Vegetable Chemical Use survey is being used to evaluate the environmental and economic impacts of agricultural chemical use in vegetable production. RTD researchers are examining a farmer's decision to adopt water quality-protecting management systems, and the roles that education, technical assistance, and financial assistance play in adoption decisions. Continued research on estimating the

value of water quality changes will facilitate developing more complete estimates of the welfare impacts of policies.

Geographic Information Systems Update

Natural resource applications abound in the world of Geographic Information System (GIS). However, relatively few applications have been developed to facilitate economic analyses of natural resource problems, despite a long history of incorporating spatial dimensions in economic sub-specialties such as regional science, regional development analyses, and river basin planning. Some areas do not lend themselves to a spatial interpretation, but many topics in the economics of agricultural conservation, global change, pollution control, and resource use have immediate spatial dimensions that can be studied more effectively in a GIS framework.

In 1992 RTD decided to develop in-house GIS capabilities. The Division has been working under a cooperative agreement with the National Center for Resource Innovations (NCRI), a congressionally established, private, nonprofit consortium, dedicated to transferring GIS and related information technologies to public decision makers. RTD wants to avoid the fate of many GIS installations that remain apart from the day-to-day work of their agencies. All ERS GIS applications are economic research projects and economists are responsible for developing the attribute data sets needed for their applications, with the assistance of the GIS Coordinator, Ralph Heimlich.

The GIS Coordinator works directly with NCRI and maintains liaison with other ERS Divisions, USDA and Federal agencies, and others in the GIS research community. The GIS Steering Committee, made up of the Division Director, Branch Chiefs, and researchers involved in applications, guides the system. The GIS Coordinator maintains and archives completed spatial and attribute data sets from each application, as well as other data sets, and will gradually develop a system data library.

Six research project applications are identified for Fiscal Year 1993:

Future Global Agricultural Resources--This application examines possible future price and welfare trends under alternative scenarios of global climate change. The project models agricultural production for land classes, defining each region's production possibilities frontier. Changes in the acreage of each land class caused by climate change simulate changes in the production possibilities frontier. These changes feed into an applied general equilibrium model that links production possibilities with global demand for agricultural products.

Effects of Air Pollution on Agricultural Productivity--Laboratory studies have determined that acid rain and ozone lead to significant yield losses for many plants. State and county indices of three air pollutants have been developed using GIS and incorporated into cross-section, time series models of agricultural productivity for the northeastern United States and California. Estimates of the costs and benefits to be obtained from pollution abatement strategies are being developed from these models. The models will also permit a close examination of technology adoption and input selection decisions made by farmers.

Policy Analysis for Post-CRP Use of CRP Land--CRP contracts begin expiring in 1996 with the potential to return much of the 36 million acres enrolled to crop production, losing the environmental benefits gained. This application examines possible future land use patterns under alternative future economic conditions and explores the cost and effectiveness of alternative policy instruments to mitigate physical and economic effects of likely post-CRP land use. ERS researchers developed a multi-component index reflecting potential benefits of retaining each CRP contract. Based on a survey of current CRP contract holders, researchers are also developing a model of landowner response to alternative policy instruments.

Water Quality and Agriculture--Impacts of agriculture on water quality and impacts of water quality policies on agriculture are site specific, depending on the resource characteristics of the land in production. Two applications are being developed for the lower Susquehanna River Basin Area study site, which is part of the Chesapeake Bay drainage. The two studies are jointly developing the physical and economic models used in the analyses.

In the first study, GIS is being used to efficiently interpret data relative to water quality and to identify areas or farming practices on which states should focus their efforts in order to increase the effectiveness of water quality protection efforts. An empirical optimizing model is being built that focuses on the adjustments farmers need to make to changes in water quality constraints under varying resource conditions. The model will help evaluate the economic consequences of alternative targeting options, shedding light on the value of using better information. This study is a cooperative effort with researchers at Virginia Tech.

In the second study, the impact of water quality constraints on agriculture will be evaluated by analyzing adjustments at the intensive margin. That is, what changes in the way crops and livestock are produced can reduce agricultural nonpoint source pollution without fundamentally altering the geographic pattern of production? Researchers at the University of Connecticut are collaborating with Virginia Tech to develop the optimizing model.

Drought-Induced Production Changes in Irrigated Crop Production--Areas in the western United States are experiencing their fourth, fifth, or even sixth consecutive drought year. The duration and extent of this drought has affected all agricultural production, including irrigated crop activities. GIS is being used to develop a drought index for each county in the western U.S. and identify drought and near-normal areas for comparison. Econometric models of aggregate production will be developed so that, given corrections for prices, soils, and short-term weather, hypothesis about general strategies for coping with drought can be tested.

New generations of GIS applications are now being considered for the system, in conjunction with RTD's annual work planning process. A working group consisting of researchers currently involved in the first generation applications will evaluate the proposals and make recommendations to Division management. A final selection of the new applications will be based on the feasibility of the GIS application, the degree to which economic analysis is integrated with GIS, and contributions to the overall Division plan of work.

EVENTS AND ACTIVITIES

Workplace Environment

RTD's commitment to improving the workplace community remains strong despite budget pressures. While the ERS Workshop on Workforce Diversity originally scheduled for this Spring was cancelled due to budget constraints, several significant activities aimed at diversifying the agricultural economics profession and improving the workforce environment are taking place.

- First, our summer intern program is underway. The program gives students an opportunity to participate in work in a public economic research institution. Each of the interns is either a student or recent graduate in agricultural economics, economics, environmental economics, or a closely related program. They assist staff economists to research and analyze issues ranging from the North American Free Trade Agreement's effect on agricultural input use in the U.S. and Mexico to the U.S. livestock sector and its relationship to agricultural stability.

Thirteen interns from twelve schools are represented this year. Ten are either women and/or minorities. The group is made up of undergraduates (3), graduate students (6), and recent graduates (4). The average grade point for participants is 3.5/4.0.

In addition, each intern has been paired with a "buddy." Buddies are staff who have volunteered to provide useful information to interns about working at ERS and living in the Washington, DC area. Interns are encouraged to participate in RTD Employee Recreation Association activities, attend research seminars, and participate in USDA-sponsored intern activities which broaden their exposure to the government. ERS is also planning to coordinate a field trip to Capitol Hill and a NASS "lock up."

- Second, we selected our first intern in the more extended (one-to-two year) program. The purpose of this program is to interest students in careers in agricultural economics through interesting work experiences. Anton Raneses graduated with a bachelors degree in economics from the University of California, Davis. He is working in the Land and Global Resources Branch on modeling the impact of climate change on agricultural sectors throughout the world.
- Third, three African American students are receiving supplemental grants for graduate study through the National Consortium for Educational Access. Kenneth Collins graduated from Jackson State University and has been accepted by the Economics Departments of the University of Missouri and the University of Illinois. Marionette Holmes received a Masters degree from Clark-Atlanta University and plans to pursue her Ph.D. in agricultural economics at Purdue University. Ezell Underdown also plans to attend Purdue. He is a graduate of the University of Michigan.
- Fourth, we are exploring ways to retain women and minorities in the face of budget cuts. Annette Kolodny, Dean of the Faculty of Humanities, University of Arizona met with RTD's management staff on June 14th. Annette had a number of interesting suggestions. One was to modify the "buddy" program from a program for new employees aimed at easing the transition to a new workplace to a program for all employees focused on dealing with the uncertainties associated with budget cuts. Another suggestion was to prepare equity impact statements for budget cuts.

RTD - USAID Program

RTD has provided economic expertise to the Technology for Soil Moisture Management Project since 1986. John Day, program leader, indicates that program planning activities currently underway expand the role of ERS in overall natural resource management research effort. New project development efforts will lead to field programs in North Africa (Morocco) and West Africa (Burkina Faso, Mali, and Senegal) as well.

The research program is a collaborative effort between RTD, U.S. universities, and participating institutions overseas. ERS is the lead institution and responsible for program performance. Washington State, Purdue, VPI, Texas A&M, North Carolina State have been involved through cooperative research agreements. Core funding for the program is provided by the Agency for International Development (AID).

The work focuses on the economics of soil, water, vegetation, and livestock management in farming systems of developing countries. The objective is to identify farm production practices and land use strategies that lead to sustainable increases in income, food, and resource productivity. To date analyses have been completed for typical farming situations in Mali, Niger, Cameroon, Benin, and Jordan.

The RTD program will now merge with an AID funded university consortium of soil science departments (Cornell, Hawaii, Texas A&M, NC State). When this arrangement begins in FY 1995, RTD will provide the economic component for this worldwide research effort to improve soil resource management through development and transfer of appropriate technology. The new responsibility greatly expands the scope for RTD activities in terms of opportunities for economic analysis of technologies, multidisciplinary cooperation, and overseas sites.

RTD is also finalizing research plans and country logistics for field work to begin this fall in Morocco, Burkina Faso, Mali, and Senegal. In each case host-country government and university researchers will participate in multi-year economic studies of household decision making and gender roles affecting resources, farm and watershed level problems, and resource policy issues. These locations, representing typical resource management issues in winter rainfall (Morocco) and summer Sahelian rainfall regimes, provide excellent potential for extrapolation of research findings to a wide geographic and agroclimatic area.

AERE Workshop

Along with EPA, and NOAA, RTD provided support and RTD researchers participated in the 1993 Association of Environmental and Resource Economists' Workshop. This year's workshop, **International Aspects of Environmental Policy**, was held in Flatrock, North Carolina. The workshop focused on international issues associated with the regulation of pollution and the exploitation of natural resources. In particular, the workshop addressed the relationship between environmental policies and trade in goods and services and the development of trade and environmental policies.

The structure of the workshop included three sessions with broad overviews of each topic area beginning each session. Papers ranged from the relationship between environmental policy and North-South trade issues (Graciela Chichilnisky, Columbia University) to the implications on trade and employment of using taxes to reduce pollution (David Simpson, Resources for the Future). A wrap-up panel summarized the workshop. Theoretical, methodological, and empirical results from the workshop shed needed light on key research areas, particularly the strategic relationship between environmental, natural resource, and trade policy. Results from the workshop will aid RTD and other ERS researchers in their understanding of the tradeoffs and linkages between trade policy and environmental issues associated with agriculture such as water quality, pesticide use, soil conservation, food safety, and biotechnology adoption.

Issues for the 1990's

RTD staff have actively contributed to the ERS **Issues for the 1990's** project. The project includes 75 short reviews of front-burner policy issues focusing on America's food and agricultural industry and rural economy. The product is in the form of a loose-leaf notebook organized into sections dealing with Trade, Commodity Programs, Environment, Food and Nutrition, Markets, Rural Economy, Technology, and Conservation. Two page bulletins may be added to the notebook as they are published. RTD bulletins published to date include:

Regulating Bio-Engineered Food; Cassandra Klotz and Margriet Caswell; AIB 664-9.

Chemical Inputs and Food Safety; Sarah Lynch and Fred Kuchler; AIB 664-16.

Expiration of Conservation Reserve Program Contracts; C. Tim Osborn and Ralph E. Heimlich; AIB 664-2

Water Reallocation and Policy Reform; Noel R. Gollehon and Marcel Aillery; AIB 664-24.

Registration of Pesticides Used to Produce Food; Sarah Lynch and Fred Kuchler; AIB 664-5

Improving Water Quality through Policy Reform; Marc O. Ribaud and Steve Crutchfield; AIB 664-7

Endangered Species Preservation and Western Water Allocation; Michael R. Moore and Marca Weinberg; AIB 664-8
Wetlands Protection Policy; Henry Buist; AIB 664-18.

The series distills information on a wide range of topics now on the policy agenda. A subscription to the complete set is available through the order desk (1-800-999-6779). Individual bulletins may be obtained by contacting the editor of **RTD TODAY** or authors.

Food Safety

Two recent meetings in the Washington area attracted RTD staff working on chemical use issues.

A Valuing Food Safety and Nutrition Conference sponsored by NE-165 provided a forum for university researchers and government officials representing USDA, EPA, FDA, and OMB. Diverse food safety issues including risk communication research needs and policies, food safety valuation methodologies and data availability were discussed. Kelly Day presented a paper entitled **Pesticide Regulation and Food Safety Risk** coauthored with Betsey Kuhn and Ann Vandeman and Ram Chandran presented **Economic Effects of Food Safety Regulations In an Open Economy**. Poster Session Papers included Steven Payson, **Food Substitution Effects from Changes in Safety Information: Evidence for Poultry, Seafood, and Pork Using the Journal Consumer Reports** and **An Exposition on Welfare Costs of a Food Safety Regulation Under Risks** by Wen-yuan Huang.

Carol S. Kramer presented a paper coauthored with Ann Vandeman entitled, **Pesticide Use In the Produce System**, at the **Workshop on Pesticide Use and Produce Quality** sponsored by the Farm Foundation and the Agricultural and Food Marketing Consortium. The paper dealt with USDA's past pesticide use data collection for fruit and vegetable crops, the current Pesticide Data Program (PDP) surveys and use of PDP data to examine the relationship between pesticide use and produce quality, and residue testing under PDP.

RTD Updates

In March, 1992 RTD initiated a pilot effort to improve communication with interested colleagues through a monthly data release **RTD UPDATES**. The Division is evaluating the role that this product will play in disseminating current information, particularly in a future of reduced publication budgets. The product was designed to complement the Division's Situation and Outlook series **Agricultural Resources**. Emphasis has been on the timely release of primary data and on topics that reflect subject matter areas across the Division. To date the following **UPDATES** have been produced:

Vegetable Survey (March 1992)
Foreign Landownership (April 1992)
Cropping Practices Surveys (May 1992)
Early-Season Water Supplies (June 1992)
Agricultural Land Values (July 1992)
Tillage Systems (August 1992)
Conservation Reserve (September 1992)
Farm Machinery (October 1992)

Area Studies - Nebraska (January 1993)
Tillage Systems (February 1993)
Fertilizer Use and Trade (March 1993)
Agricultural Real Estate Taxes (April 1993)
Foreign Landownership (May 1993)
Changes in Farmland Values (June 1993)
Area Studies - Indiana (June 1993)
Agricultural Land Values (July 1993)
Cropping Practices (July 1993)

The Division is interested in feed-back on this product and will be expanding the mailing list in an attempt to reach an interested audience. If you would like to be added to the mailing list or have comments, please contact the editor of **RTD TODAY**.

PEOPLE

Welcome to ...

- Laurian Unnevehr (E&HR), formerly Associate Professor of Agricultural Economics, University of Illinois at Urbana-Champaign, who is the new Chief of the Environmental and Health Risk Branch.

Our Summer Interns

- Pearl Buenvenida (E&HR), who is majoring in Economics at the University of Maryland.
- Farley Burge (L&GR), who is a graduate student in Environmental Economics at Duke University.
- Jonathan Cohodas (P&ET), who is a graduate student in Economics at Virginia Tech.
- Tracy Cruz (RP), who is a law student at St. Johns University.
- Leslie Dews (P&ET), who is a graduate student in Economics at Howard University.
- Rhonda Franklin (E&HR), who is majoring in Economics at Clark-Atlanta University.
- Jacquelyn Griffin (E&HR), who is a graduate student in Marketing at Pennsylvania State University
- Trudi Hughes (P&ET), who majored in Agricultural Business at California Polytechnic.
- Elisha Nuzum (L&GR), who is majoring in Economics at Ohio University.
- Anthony Shen (P&ET), who is majoring in Economics at Stanford University.
- Cynthia Tyler (L&GR), who majored in Economics at Ohio University.
- Brad Umidi (RP), who majored in Economics at James Madison University.
- Nytasha Walters (OD), who is a graduate student in Public Administration at University of Washington.

Appointment Changes ...

- Ann Vandeman (P&ET), is the new Data Coordinator.

Farewell to ...

- Rachel Beattie (RP), who will be attending graduate school at Yale University.
- Henry Buist (L&GR), who accepted a position at the Federal National Mortgage Association.
- Tracy Glascoe (P&ET), who plans to attend Trinity College.
- William Hyde (W), who is Chairman, Department of Forestry, at Virginia Tech.
- John Michos (L&GR), who is attending graduate school at George Mason University.
- Bridget Struggs (RP), who will be attending Prince George's Community College.

PUBLICATIONS

(October 1992 - July 1993)

ERS/USDA PUBLICATIONS

Monographs

- Buist, Henry. Wetlands Protection Policy. Agriculture Information Bulletin No. 664-18. April 1993. 2 pp.
- Butler, Gertrude S. and J. Peter DeBraal. Foreign Ownership of U.S. Agricultural Land Through December 31, 1992: County-Level Data. Statistical Bulletin No. 854. May 1993. 128 pp.
- Crutchfield, Stephen R., Marc O. Ribaud, Leroy T. Hansen, and Ricardo Quiroga. Cotton Production and Water Quality: Economic and Environmental Impacts of Pollution Prevention. Agricultural Economic Report No. 664. December 1992. 33 pp.
- DeBraal, J. Peter. Foreign Ownership of U.S. Agricultural Land Through December 31, 1992. Statistical Bulletin No. 853. May 1993. 49 pp.
- Fernandez Cornejo, Jorge. Demand and Substitution of Agricultural Inputs in the Central Corn Belt States. Technical Bulletin No. 1816. February 1993. 27 pp.
- Fernandez Cornejo, Jorge, E. Douglas Beach, and Wen-Yuan Huang. The Adoption of Integrated Pest Management Technology by Vegetable Growers. Staff Report No. AGES-9228. November 1992.
- Gollehon, Noel R. and Marcel P. Aillery. Water Reallocation and Policy Reform. Agriculture Information Bulletin No. 664-24. April 1993. 2 pp.
- Hellerstein, Daniel, Danette Woo, Daniel McCollum, and Dennis Donnelly. ZIPFIP: Synopsis of an ERS Database of County and Zip Code Information. Staff Report No. AGES-9309. June 1993. 4 pp.
- Hohmann, Neil, and C. Matthew Rendleman. Emerging Technologies in Ethanol Production. Agriculture Information Bulletin No. 663. February 1993. 17 pp.
- Jones, John and Patrick N. Canning. Farm Real Estate Historical Series Data, 1950-92. Statistical Bulletin No. 855. May 1993. 55 pp.
- Klotz, Cassandra and Margriet F. Caswell. Regulating Bio-Engineered Foods. Agriculture Information Bulletin No. 664-9. April 1993. 2 pp.
- Malik, Arun S., Bruce A. Larson, and Marc O. Ribaud. Agricultural Nonpoint Source Pollution and Economic Incentive Policies: Issues in the Reauthorization of the Clean Water Act. Staff Report No. AGES-9229. November 1992. 14 pp.
- Moore, Michael R., and Marca Weinberg. Endangered Species Preservation and Western Water Allocation. Agriculture Information Bulletin No. 664-8. April 1993. 2 pp.
- Lynch, Sarah and Fred Kuchler. Chemical Inputs and Food Safety. Agriculture Information Bulletin No. 664-16. April 1993. 2 pp.

- Lynch, Sarah and Fred Kuchler. Registration of Pesticides Used to Produce Food. Agriculture Information Bulletin No. 664-5. April 1993. 2 pp.
- Osborn, C. Tim and Ralph E. Heimlich. Expiration of Conservation Reserve Program Contracts. Agriculture Information Bulletin No. 664-2. April 1993. 2 pp.
- Osborn, C. Tim., Felix Llacuna, and Michael Linsenbigler, The Conservation Reserve Program: Enrollment Statistics for Signup Periods 1 - 11 and Fiscal Years 1990-92. Statistical Bulletin No. 843. November 1992. 86 pp.
- Quiroga, Ricardo E., Kazim Konyar, and Ian McCormick. The U.S. Agricultural Resources Model (USARM): Data Construction and Updating Procedures. Staff Report No. AGES-9304. April 1993. 49 pp.
- Rendleman, C. Matthew. Estimation of Aggregate U.S. Demands for Fertilizer, Pesticides, and Other Inputs: A Model for Policy Analysis. Technical Bulletin No. 1813. March 1993. 28 pp.
- Ribaudo, Marc O., Stephen S. Crutchfield. Improving Water Quality through Policy Reform. Agriculture Information Bulletin No. 664-7. April 1993. 2 pp.
- Vroomen, Harry, and Harold Taylor. Fertilizer Trade Statistics, 1970-91. Statistical Bulletin No. 851. January 1993. 39 pp.
- Vroomen, Harry, and Harold Taylor. Fertilizer Use and Price Statistics, 1960-91. Statistical Bulletin No. 842. November 1992. 57 pp.

Articles

- Crutchfield, Steve and Joe Cooper. **Environmental Advantages of Agricultural Products**. New Crops, New Uses, New Markets. 1992 Yearbook of Agriculture. USDA. GPO. Washington, D.C. 1992. pp. 276-279.
- DeBraal, J. Peter. **Farm Real Estate Taxes**. Agricultural and Rural Economic and Social Indicators. Agriculture Information Bulletin No. 667. March 1993. pp. 40-41.
- DeBraal, J. Peter. **Foreign Ownership of U.S. Agricultural Land**. Agricultural and Rural Economic and Social Indicators. Agriculture Information Bulletin No. 667. March 1993. pp. 42-43.

Situation and Outlook

Periodicals

- Bull, Len and Harold Taylor (Coords). Agricultural Resources: Inputs. Situation and Outlook Report Nos. AR-28, AR-29. October, 1992; February 1993. 55 pp.; 68 pp. Contributors to the reports are:

Len Bull
Herman Delvo

Mohinder Gill
Harold Taylor

Noel Uri
Marlow Vesterby

Daberkow, Stan and Richard Magleby (Coords.) Agricultural Resources: Cropland, Water, and Conservation. Situation and Outlook Report No. AR-30. May 1993. 46 pp.
Contributors to the report are:

Marcel Aillery
Noel Gollehon
Bill Quinby

Art Daugherty
Richard Magleby
Carmen Sandretto

Dwight Gadsby
Tim Osborn

Hexem, Roger (Coord.). Agricultural Resources: Agricultural Land Values. Situation and Outlook Summary. AR5-93. May 1993. 7pp.

Hexem, Roger (Coord.). Agricultural Resources: Agricultural Land Values and Markets. Situation and Outlook Report No. AR-31. June 1993. 34 pp. Contributors to the report are:

Roger Hexem

Peter DeBraal

John Jones.

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DeBraal, J. Peter. **Foreign Landownership is Small and Static**. Agricultural Outlook. May 1993. p. 24.

Delvo, Herman, Mohinder Gill, Harold Taylor, and Len Bull. **Peanut Production Practices and Input Use - 1991**. Agricultural Resources: Inputs. Situation and Outlook Report No. A-28. October 1992. pp. 30-35.

Gill, Mohinder, Herman Delvo, Harold Taylor, and Len Bull. **Sorghum Production Practices and Input Use - 1991**. Agricultural Resources: Inputs. Situation and Outlook Report No. A-28. October 1992. pp. 36-39.

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Irwin-Hewitt, T., and L. Lohr. **Economic and Environmental Impacts of Alternative Cropping Sequences in Michigan**. Agricultural Resources: Inputs. Situation and Outlook Report No. AR-29. February 1993. pp. 40-43.

Kuchler, Fred and Katherine Ralston. **Impacts of the Delaney Clause Court Ruling**. Agricultural Outlook. AO-196. May 1993. pp. 29-32.

Lin, Bing-Hwan, Sharon Jans, Kevin Ingram, and Leroy Hansen. **Pesticide Productivity in Pacific Northwest Potato Production**. Agricultural Resources: Inputs. Situation and Output No. AR-29. February 1993. pp. 44-48.

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Ribaudo, Marc O. **Atrazine and Water Quality: Issues, Regulations and Economics**. Agricultural Resources: Cropland, Water, and Conservation. Situation and Outlook Report No. AR-30. May 1993. pp. 42-45.

Shields, Martin L. and Stan Daberkow. **The Relationship Between Cropping Patterns and Insecticide Use in Cotton Production**. Agricultural Resources: Inputs. Situation and Outlook Report No. AR-29. February 1993. pp. 49-53.

- Taylor, Harold H. and Marlow Vesterby. **Outlook for Production Inputs.** Proceedings of Agriculture's Changing Horizon, Agriculture Outlook '93. YCON-93. USDA. December 1993. pp. 320-329.
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